CoMET Status Epilepticus Management Guideline

This guideline is for use by healthcare staff, at CoMET undertaking critical care retrieval, transport and stabilization of children, and young adults.

CoMET is a Paediatric Critical Care Transport service and is hosted by the University Hospitals of Leicester NHS trust working in partnership with the Nottingham University Hospitals NHS Trust.

The guidance supports decision making by individual healthcare professionals and to make decisions in the best interest of the individual patient.

This guideline represents the view of CoMET, and is produced to be used mainly by healthcare staff working for CoMET, although, professionals, working in similar field will find it useful for easy reference at the bedside.

We are grateful to the many existing paediatric critical care transport services, whose advice and current guidelines have been referred to for preparing this document. Thank You.
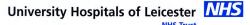
Executive Lead/ Medical Director:	**Andrew Furlong (LRI, UHL – andrew.furlong@uhl-tr.nhs.uk)**
Author:	**Kathryn Hudson, CoMET Nurse** **kathryn.hudson@nuh.nhs.uk** **Jennifer Tsang, CoMET Registrar** **Jennifer.tsang@nuh.nhs.uk** **David Bird, CoMET Consultant** **david.bird@nuh.nhs.uk**
Guideline Lead:	**Mohammad Zoha – CoMET Consultant, UHL** **Mohammad.zoha@uhl-tr.nhs.uk**
Clinical Lead:-	**Georgina Harlow – CoMET Clinical Lead** **gharlow1@nhs.net** **Georgina.harlow@uhl-tr.nhs.uk**
Approved By:	**UHL Policy and Guideline Committee**
Date of Latest Approval:	**16 August 2024**
Version:	**1**
Next Review Date:	**August 2026**

Education and Training
1. Annual Transport team update training days
2. Workshops delivered in Regional Transport Study days/ Outreach

Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Incident reporting	Review related Datix	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	Monthly	CoMET Lead Governance Meeting
Documentation Compliance	Documentation Audit	Abi Hill – Lead Transport Nurse abi.hill@uhl-tr.nhs.uk	3 Monthly	CoMET Lead Governance Meeting

Management of status epilepticus in children

ABCDE approach

Call for anaesthetic support early if there are any airway or breathing concerns.

Early indications for intubation:
• Airway compromise at any time
• Hypoxia
• GCS remains <8
• To establish neuroprotection in a child requiring a CT scan and pending results.

Treat shock	
Treat hypoglycaemia	Give 2ml/kg 10% dextrose IV
Treat hyponatraemia (Na <130)	Give 3-5 ml/kg 2.7% hypertonic saline IV over 15 minutes, via CVL or peripheral cannula (*preferably CVL*)
Treat sepsis	1st line: Ceftriaxone +/- Aciclovir
Treat raised ICP	1st line: 3-5ml/kg 2.7% hypertonic saline IV over 15 minutes (Note - do not give if Na > 160) 2nd line: 0.5g/kg mannitol IV over 30 minutes

Useful early investigations:
• Full blood count
• Urea and electrolytes
• Calcium, phosphate
• Magnesium
• CRP
• Clotting screen and fibrinogen level
• Blood culture, if the child is febrile
• **Blood glucose**
• **Capillary or venous blood gas**
• *Serum ammonia* - if concerned about underlying metabolic disorder

DO NOT PERFORM A LUMBAR PUNCTURE
• IN THE FIRST 24 HOURS AFTER STATUS
• IF ANY SIGNS OF RAISED INTRACRANIAL PRESSURE

CHILD IN STATUS EPILEPTICUS
Treat seizures as per APLS algorithm (updated 2022) - see overleaf
(**Note** - Follow the child's personalised epilepsy plan if available - this may include alternative agents that are not in the APLS algorithm e.g Paraldehyde)

If the seizure does not terminate after **Step 3** (i.e. after Levetiracetam loading dose), proceed with Phenytoin/Phenobarbitone loading dose and contact CoMET retrieval team for advice +/- referral.

CoMET Retrieval Service telephone number: 0300 300 0023

Following discussion with CoMET team, if advised to prepare for
Rapid Sequence Induction (RSI)
Usual drugs of choice are:
• **Ketamine 2mg/kg**
• **Rocuronium 1mg/kg**
N.B. Other induction agents may be used if the child is haemodynamically stable.

Propafol infusion can be started if going for CT scan or needing short-term procedural sedation.
• Usual dosage 1-5mg/kg/hour
• Do not use if the patient is haemodynamically unstable

Indications for CT head +/- contrast:
• SIgns of raised intracranial pressure (pupil changes, focal neurology, bradycardia, hypertension)
• Suspected space-occupying lesion
• VP shunt in situ and suspected blockage
• Focal seizures or neurology
• Trauma
• Non-accidental injury
• Refractory seizures

Has a CT head scan been performed?

Normal CT head report

Most children are succesfully extubated in this setting

UNLESS there is:

• Ventilation difficulties (high FiO2 or ventilation pressures)
• Circulatory instabillity (commonly resolves when sedation infusions stop)
• Ongoing refractory seizure activity

Abnormal CT head report

Immediate consideration - **IS THIS A TIME-CRITICAL TRANSFER?**
If yes, refer to the 'time critical pathway'.

Discuss with CoMET regarding further management.
+/- Neurology team
+/- Neurosurgical team

• Start neuroprotective measures (head-up positioning, control CO2, deep sedation, maintain adequate BP, hypertonic saline/mannitol)
• Prepare for transfer.

For refractory prolonged seizures unresponsive to initial APLS management and RSI, start a midazolam infusion

• Midazolam infusion in **refractory** status epilepticus :
  ◦ 500 microgram/kg bolus
  ◦ Followed by continuous infusion, starting at 125 micrograms/kg/hour
  ◦ If seizure activity continues after 10-15 minutes, give a second bolus of 500 micrograms/kg and increase the infusion rate to 250 micrograms/kg/hour and discuss further with CoMET retrieval team.
• Note: There is a **risk of hypotension** with escalating doses of midazolam. Ensure adequate access for central/peripheral inotropes if required.

• Add Morphine infusion (10-40 micrograms/kg/hour) if additional sedation required

5 min From onset of convulsion

Secure airway
High flow oxygen
Consider reversible causes
(Don't ever forget glucose)

- Individual Emergency Plan takes precedence
- Early anaesthetic support if ABC concern *
- Pre-hospital benzodiazepine doses count

STEP 1

Vascular access? — YES / NO

Lorazepam (IV / IO)

0.1mg/kg (max 4mg)

Midazolam (buccal)

3-11 months	2.5mg
1-4 years	5mg
5-9 years	7.5mg
10-17 years	10mg

~ 0.3mg/kg (max 10mg)

OR

Diazepam (rectal)

1 month-1year	5mg
2-11 years	5 – 10mg
12-17 years	10 –20mg

~ 0.5mg/kg (max 20mg)

Pre-hospital (trained parent(s) / carer(s) / paramedics)
OR
In hospital

5 min After 1st benzodiazepine

Convulsion ongoing? (check ABC)* — NO → Monitor

⚠️ **ANTICIPATE**
Get 2nd dose Benzodiazepine ready

Maximum 2 doses
(including pre-hospital doses)

YES

STEP 2

Vascular access? — YES / NO

Lorazepam (IV / IO)

Midazolam (buccal)
*dose as per step 1

OR

Diazepam (rectal)
*dose as per step 1

*dose as per step 1

Pre-hospital (with paramedics)
OR
In hospital

5 min After 2nd benzodiazepine

Convulsion ongoing? (check ABC)* — NO → Monitor

⚠️ **ANTICIPATE:**
Get Levetiracetam ready

YES

STEP 3

Levetiracetam 40mg/kg IV / IO (max 3g)
Give over 5 minutes

Refer to local monograph for dilution and infusion.

⚠️ **ANTICIPATE:**
Get Phenytoin / Phenobarbitone ready

Prepare for RSI

Convulsion ongoing? (check ABC)* — NO → Monitor

YES

10 min After infusion finished

STEP 4

Team ready for immediate RSI? — YES

NO

Already on phenytoin? — NO / YES

In hospital with paediatric registrar and/or consultant

Anaesthetic team MUST be present

Phenytoin 20mg/kg IV / IO (max 2g)
give over 20 minutes

Phenobarbitone 20mg/kg IV / IO (max 1g)
give over 20 minutes

Refer to local monograph for dilution and infusion. Cardiac monitoring.

After infusion finished

Convulsion ongoing? (check ABC)* — NO → Monitor

YES

Anaesthetist **MUST** be present

Inform PICU and/or paediatric retrieval team

Rapid Sequence Induction (RSI)
Ketamine 1-2mg/kg

OR **Thiopental** (Thiopentone) 3-5mg/kg IV/IO
OR **Propofol** (refer to local monograph)